

WHAT IS CLAIMED IS:

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1. A process for treating a substrate with plasma comprising:  
generating said plasma in the form of plane in a chamber.
  2. The process of claim 1 further comprising moving said substrate  
5 through said plasma in a direction perpendicular to said plane of said plasma to treat  
said substrate with said plasma.
  3. The process of claim 2 wherein pressure in said chamber is in the  
range of from 0.1 to 800 Torr.
  4. The process of claim 2 wherein a starting material gas is flown into  
10 said plasma in a direction parallel to said plane of said plasma from at least one gas  
supply slit provided in a ground electrode provided in said chamber.
  5. The process of claim 2 wherein said plasma has a cross section in  
parallel to said substrate at a ratio (length thereof)/(width thereof) of 10 or more.
  6. The process of claim 4 wherein said gas supply slit has a ratio (length  
15 thereof)/(width thereof) of 5 or more.
  7. The process of claim 2 wherein a starting material gas is flown into  
said plasma in a direction parallel to said plane of said plasma from a plurality of gas  
supply ports arranged on a line and provided in a ground electrode provided in said  
chamber.
  - 20 8. A process for depositing a diamond-like carbon film comprising:  
generating a plasma in the form of plane in a chamber for depositing  
said diamond-like carbon film; and moving a substrate through said plasma in a

direction perpendicular to said plane of said plasma to deposit said diamond-like carbon film on said substrate.

9. The process of claim 8 wherein pressure in said chamber is in the range of from 0.1 to 800 Torr.

5 10. The process of claim 8 wherein a starting material gas is flown into said plasma in a direction parallel to said plane of said plasma from at least one gas supply slit provided in a ground electrode provided in said chamber.

10 11. The process of claim 8 wherein a starting material gas is flown into said plasma in a direction parallel to said plane of said plasma from a plurality of gas supply ports arranged on a line and provided in a ground electrode provided in said chamber.

12. The process of claim 10 wherein said starting material gas comprises  $\text{Si}(\text{C}_x\text{H}_{2x+1})_{4-y}\text{H}_y$  where x is an integer of 1 or more, and y is an integer from 0 to 3.

13. The process of claim 8 wherein said plasma contains a methyl group.

15 14. A method for forming a diamond-like carbon film by a roll-to-roll apparatus comprising:

a feeding roll for feeding an organic resin film therefrom;  
a winding roll for winding said organic resin film therearound; and  
at least one chamber for forming said diamond-like carbon film, said

20 method comprising:

revolving said winding roll to wind said organic resin film therearound so that said organic resin film is passed through said at least one chamber; and

forming said diamond-like carbon film in said at least one chamber by a plasma generated in the form of plane in said at least one chamber during said revolving step.

15. The method of claim 14 wherein said organic resin film has a magnetic layer provided thereon, and said diamond-like carbon film is formed on said magnetic layer.

16. An apparatus for fabricating a magnetic recording medium by sequentially and continuously forming a magnetic layer and a diamond-like carbon film on a polymer substrate material, said apparatus comprising:

10 a first vacuum vessel for forming the magnetic layer of the magnetic recording medium; and

a second vacuum vessel for forming the diamond-like carbon film, wherein the pressure difference between the operation pressures for the first vessel and the second vessel is set in the range of from  $10^{-2}$  to  $10^{-5}$  Torr.

15 17. The apparatus of claim 16 further comprising a third vacuum vessel for performing plasma activation treatment between the first vessel and the second vacuum vessel.

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